A COMPARISON OF VARIOUS METHODS OF AUDIO-VISUAL INSTRUCTION

By

WALTER EHERHART LENTZ II

Bachelor of Science

Oklahoma State University

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O S Hulbert
Thesis Adviser

R W Tinnell

Irving W. Dugger

Norman D Durham
Dean of the Graduate College

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CHAPTER I

INTRODUCTION

Background Information

The use of audio-visual media as an aid to instruction in the classroom is common practice among occupational instructors. Types of aids and equipment used include various projectors, movies, slides, audio tapes, overhead transparencies, filmstrips, and charts plus some lesser used materials. Most of these types of media can be used individually or in combination with each other.

Many instructors have had little or no formal training in the operation of different types of equipment to produce the maximum effect of the information being presented. And in many cases they have no one available who has this type of knowledge or experience. This situation usually results in material being presented poorly or incorrectly. It may also cause a loss of interest in the subject matter being presented.

The quality of the materials and equipment plays a large part in keeping the attention of an audience and in maximizing the effect of a presentation.

Faulty or incorrect operation of any audio-visual equipment during a presentation can cause an audience to be distracted from the purpose of a presentation and at times may cause the audience to think the instructor lacks competency. Many times people remember the fact that the projector worked improperly or that the transparency was not legible

instead of remembering what the presentation was about.

In certain cases, not knowing or realizing the results of combining different methods of presenting material may cause a presentation to be ineffective or vague.

Statement and Purpose of the Problem

The audio-visual course being studied, i.e., Technical Education 4112 at Oklahoma State University, was taught using five different teaching methods over a two semester period. Each method included the use of project packets including instructional modules describing the projects to be done during the course. The packets contained the project outlines, description of each project, and materials to be used for each project. Included in the modules was general to specific information concerning the projects. Materials with the modules included a cassette audio-tape, an overhead transparency frame, film and other accessories to make an overhead transparency. The modules and project materials were contained in a packet which the students received at the beginning of the course. Film and cameras needed for photographic slides were furnished by the students. The Technical Education Department loaned, on a request basis, the video recording tape and equipment to make audio-visual movies.

This study was done to determine whether the method of instruction and types of instructional materials used in the course adequately taught audio-visual preparation and presentation methods. The study was designed to compare types of instruction to determine the most efficient method. The results will indicate if the supplemental text being used provided any additional worthwhile knowledge or competency.

Nature of the Study

People who plan to teach or who may at sometime have the need to use audio-visual equipment and techniques need to know the techniques for using the different audio-visual media to present material to their audiences in an effective manner.

The results of this study may indicate changes in the type of instruction needed in order for students to be more effective in audio-visual presentations.

The effectiveness of the instruction received by the students was determined by conducting a study of the competencies achieved and knowledge gained by the students who received instruction in the course.

Research Questions

This study attempted to answer these questions:

(1) Were the audio-visual instructional modules used an effective means of instruction without the use of a supplemental textbook?

(2) Did classroom instruction produce greater mastery of the audio-visual material preparation and preparation methods than did self-paced instruction?

(3) Which type of instruction provided the student with the most efficient methods of using audio-vidual materials?

CHAPTER II

REVIEW OF LITERATURE

Identification of the Need

Several studies have been done, which parallel the scope of this study, on the effectiveness of using audio-visual equipment and media to teach different types of courses, but few were found that had any connection to the effectiveness of learning processes that teach the use of the media and the techniques used to operate audio-visual equipment. On the other hand, there is a variety of material made available by different companies that outline procedures and tips to use in operating their audio-visual equipment. Some brochures include information on how to improve techniques for an individual's own use.

Different media have been used and compared to determine which has the best ability to relay the subject matter, but again, only comparisons have been made and not the actual teaching of the operations of the equipment to develop efficiency in their use and the preparation of audio-visual materials. In many comparisons of different media, one may be eliminated because of negative results from the operator, when proper operation and knowledge of the media may have resulted in that particular media being used as a primary source. This is not to say that some media are not indeed better suited for certain types or presentations than others.

For example, if a teacher is unable to assemble an effective transparency for use on an overhead projector, he/she may prefer to use a chalkboard as a means of relaying information. If an effective transparency had been made, the contained information would be readily available, easily projected and save time and effort at the chalkboard. Color detail is also an advantage of using a transparency in describing how gears mesh, parts fit together, sequence of assembly, etc.

Tendencies in many school systems are to use the types of media that have always been used because of a limited knowledge of other types of media that are available. Although budgets may have limited improvements in this area in some cases.

Usually, to introduce a new type of audio-visual media into a school system a teacher that is interested in using it or has had some experience with it is asked or volunteers to work with it and learn how to use it efficiently and establish guidelines for its use.

If an effective means of learning about audio-visual equipment and media is offered during a teacher's education, it would aid him or her in being able to handle these types of situations more efficiently and effectively.

In a study by Milton E. Larson (1, p. 5) he recommended that research was needed in the areas of "....(1) instructional materials and devices, (2) learning processes and teaching methods, (3) facilities and equipment..."

A more recent indication of need for study in this area is that the Oklahoma State Department of Vocational and Technical Education listed among its top twelve priorities for fiscal year 1976, a request for a program to provide in-service training for vocational and technical education teachers in curriculum education, media development and utilization.

This study was done in an effort to determine the method of instruction which is most effective in teaching the uses of audio-visual equipment and material to help satisfy the needs established. This request was made specifically by the Technical Education Department, Oklahoma State University.

Results of Previous Research

Since there is quite an amount of material available concerning the subject of comparing different types of teaching methods, it seemed impractical to try to research all of it, therefore only a few studies were picked as examples.

In a study by Leslie J. Briggs (2) an analytical procedure was developed which constituted a basis for matching media with educational objectives. Using this procedure, educational personnel who were responsible for the conduct of instruction were also responsible for choosing the medium in which it would be programmed. Normally, the choice would come at the time of the original design of the curriculum. In applying the procedure developed, the behavioral objectives for the course or unit were stated. By identifying the type of learning involved for each objective, a media program was developed which listed instructional events, identified characteristics of required stimuli, and stated acceptable media options. The media options were then scanned for frequently occurring media. From this, the medium in which the instruction should be packaged was assigned and the specifications for the materials written.

A study conducted by Benjamin F. Richason, Jr. (3, p. 4) stated that the Audio-Visual-Tutorial Laboratory at Carroll College purposed to

> ...improve the content of the Freshman-Sophomore course in physical geography, stimulate interest, promote independent learning, provide flexibility of class meeting times, make adjustments for the diversity of educational backgrounds, and promote economy of instruction...

The course consisted of laboratory work and discussion sessions. With this method and the way the equipment was used and made available to the students approximately 40% more content was presented and an improvement of 28.75% was noted in examination scores.

Most instructors who take pride in their teaching will agree that lecturing in itself is not the most effective style of teaching. To be effective the instructor must use every means available to assist the student in learning the subject matter.

Because of this concept a system of self-paced learning modules was developed for the graphic arts program at Kirkwood Community College (4). The program is designed so students may progress at their own pace and learn according to their desires and abilities. Due to this policy, a student can adjust his daily schedule to work on and complete assignments in any of the courses he is enrolled in, thus utilizing work areas and equipment as they are available.

This self-paced package for each course contains behavioral objectives, a project workbook, study guides, overhead transparencies, and video tapes. The main part of the package is the project workbook containing a series of modules outlining specific behavioral objectives to be attained by the students.

The role of the instructor is not to conduct formal lectures, but to aid and participate with the students on their projects. The advantage of this system is its ability to raise the level of student comprehension and competency.

Using this system, the students demonstrated a significant improvement in the understanding of concepts and in the mastery of manipulative skills compared to the traditional lecture/lab form of instruction.

Although these examples may not be directly related to the process of teaching audio-visual preparation and presentation methods, the techniques employed can be related to the techniques used to gather data for this study.

Methodology of Previous Research

The Pre-test, Post-test method is one method frequently used in determining the effectiveness of teaching methods. This method consists of administering a test prior to any instruction being given in the course. The test can be general in nature or it can be specific in detail. At the conclusion of the course, another test is given which has been developed around the subject matter taught during the course. Results of these tests are studied in an effort to indicate whether the teaching method used has provided the students with enough knowledge of the subject. Changes in instruction can be made in reference to the test results to either increase or decrease the intensity of the subject matter or whether or not to alter the method of instruction.

Another method of determining the effectiveness of teaching methods is to do a follow-up study of the students who have taken a course. Results gathered from this type of study show if the student remembered competencies or knowledge learned while taking a course in the event of being faced with the situation of having to rely on his education. If the results obtained are positive and the student has had no further study in the area, it is assumed that the teaching methods or techniques were effective.

A detailed student evaluation of the course is a method used in obtaining the student response to a course and is one of the most common methods used in evaluating a course and the instructional methods used.

Summary

The need for research in the area of teaching methods of using audio-visual equipment and media has been established by at least three different sources: (A) Milton E. Larson (1), (B) the State Department of Vocational and Technical Education of Oklahoma and (C) the Technical Education Department in the School of Occupational and Adult Education at Oklahoma State University.

While few studies have been done in this area, studies have been made which parallel the objectives of this study. The results of previous research indicate some of the types of instruction that can be used to teach competencies effectively.

The methodology of the pre-test, post-test will be used in this study to determine the effectiveness in the instruction of audio-visual preparation and presentation methods.

CHAPTER III

METHODOLOGY

Definitions

Audio-Visual Instructional Module - Consisting of a few pages, each module outlined the procedures used to complete a project. Each one included: (1) An Introduction, which briefly explained the media to be used for the project; (2) A Discussion, which discussed the media in more detail. Examples of the uses were given, and in the case of the media being equipment, step-by-step instructions were given in the operation of it. A step-by-step outline was also given on how to complete the project assigned; (3) A List of Materials; (4) The Assignment; and (5) Evaluation, in which the student summarized his project and its results.

Conventional Style of Teaching - Students attended class and laboratory sessions and received lecture and instruction from the course instructor.

Assumptions

Techniques of using audio-visual equipment and knowledge of how to use the different media in different situations are learned by teachers on a second-hand basis. That is, they learn the knowledge and competencies on-the-job from someone else or from their own experiences.

Most students enrolled in the audio-visual instruction course studied were being introduced to formal A.V. instruction for the first time. The only contact they may have had with audio-visual material was having seen films projected by a movie projector or filmstrip projector. Although they may have been aware of audio-tapes they probably had never developed them to use with films or slides, and had had no experience in the operation or in the preparation of audio-visual materials to be used for presentations.

Most of them had probably used some sort of a camera before.

Selection of the Subjects

The subjects selected for this study were college students. They were the logical choice because during the course of their education many were required to take the course being studied as part of their curriculum. Also, most of them had had no practical experience or knowledge of audio-visual equipment and media, which aided in the students being on an even basis for the pre-test and for preparation of the post-test.

Development of the Instrument

The instruments used in this study were a pre-test and a post-test. The selected instruments had been developed and were previously used in an effort to evaluate the course and make necessary improvements, if any. They were also used in an attempt to determine if students had learned anything about audio-visual preparation and presentation methods during the course. The instruments were revised in an attempt to prevent direct repetition between the two tests. Although revisions were made,

the areas of subject concentration on the tests remained the same.

The instruments were chosen because they gave a quick response and the scores were to be tabulated to show central tendencies indicated by the mean, median and mode, and show the variance of scores represented by the range, and standard deviation.

Collection of the Data

Five different teaching methods were set up to collect data for this study. Each method was used with at least one section of students. Each section was given the same pre-test at the beginning of the semester before any instruction on audio-visual preparation and presentation methods was given. Being enrolled in a specific class section determined which method of instruction they received. The groups studied were: (1) full-time students, using the conventional method, in which the students received instruction through lecture, lab instruction and participation, and using the instructional modules with the textbook for reference, (2) full-time students, using the conventional method except no textbook was used, (3) an eight-week student teaching block course, using the conventional method with a textbook, (4) an eight-week student teaching block course, using the conventional method, but with no textbook, and (5) in-service teachers, using the independent study method with no textbook.

Two full semesters were compared in an attempt to get an accurate measurement of knowledge and competencies acquired by the students.

The fall semester of 1975 included three class sections. Section one was made up of full-time students and was taught by the conventional method, using the textbook and instructional modules and receiving

instruction through lecture and lab sessions. They received the post-test as a final examination.

Sections two and three were composed of students on "block" type instruction, i.e., student teachers. They received the audio-visual course instruction during the first eight weeks of the semester, before doing their practice teaching, but had until the end of the semester to complete their projects. They used the textbook and instructional modules and received instruction through lecture and lab sessions and were given the post-test at the end of the eight week period as their final examination.

The spring semester of 1976 included four sections. Section one was made up of full-time students and was taught by the conventional method except no textbook was used.

Sections two and three were composed of the students on "block", and received instruction in the conventional manner except no textbook was used.

Section four was the independent study group. The class was made up mostly of in-service teachers and met four times during a full length semester. These meetings consisted of informal type discussions about the projects and no lecture was given. The first meeting consisted of an explanation of the projects to be completed and administering the pre-test. The project modules were the only formal type of instructional material used. The students worked on their projects mostly on their own and had the opportunity to use the second and third class meetings to work on them and use the lab facilities. Arrangements could also be made to use the lab facilities at other times. The last class meeting was used to administer the post-test.

Analysis of the Data

After the test scores from the pre-tests and post-tests were received, they were compiled to indicate the mean, median, mode, range and standard deviation. The high and low scores from each set of pre-tests and post-tests of each section were also indicated. With reference to these results from each method of instruction the most effective method of instruction was determined.

CHAPTER IV

RESULTS OF THE STUDY

Introduction

The goals of this study were to determine the effectiveness of different methods of instruction and whether or not the instructional project modules supplied a satisfactory amount of information on audio-visual preparation and presentation methods without the support of an audio-visual textbook.

The tests used as the instruments were used not only to collect data, but were used in an effort to determine if the students were adequately learning the material.

Return Rates

Only those students who took both the pre-test and post-test were used as sources for data. A few students who took the pre-test, later dropped from the course, and there were a few who had taken the post-test, but for some reason or another had failed to take the pre-test. An effort was made to give the pre-test to those students who enrolled late.

Data Summary

Ideally, each section should have been taught by the same instructor each semester. As it was, one instructor taught the course the first semester in addition to section four of the second semester. Another

instructor taught the first three sections of the second semester.

When the pre-test was given, the students were instructed not to guess at the answers if they did not know the correct response. This was done in an attempt to find out as accurately as possible what they actually knew about the subject matter.

The emphasis given by each instructor that the pre-test would definitely have no effect on their grade, that it was only a measurement of knowledge, may be one reason why the pre-test scores were low.

In most cases the students who scored low on the pre-test, scored fairly high on the post-test. Likewise, most of the students who scored favorably on the pre-test, also scored high on the post-test. There were a few students whose scores were close to the same on the post-test as they were on the pre-test, but there were no occurrances of an individual's post-test score being lower than his pre-test score.

The results of each section's pre-test performance are indicated in Table I. This information was obtained to be used as a basis of comparison as to the post-test scores.

Because the pre-test was given prior to any instruction in the course, the students could rely only on their past education and experiences, if any, with audio-visual materials and equipment in answering the questions.

As can be noted from the table, the mean of the first, third, and fifth groups was higher than the mean of the second and fourth sections. This likely resulted from the fact that the test was given to the first, third, and fifth groups after the instructor had outlined the semester and described the method of grading, etc. The students were then given the remainder of the two-hour period to take the test. Although the

students were encouraged not to guess at the answers, they had adequate time to reason with each question, therefore providing a better chance for completion of the test.

TABLE I

PRE-TEST RESULTS

Teaching Method and Sections	High	Low	Range	Mean	Median	Mode	Standard Deviation
Conventional Method with Textbook Fall '75, Sec. 1	41	9	32	24.59	27	17 28,29	9.59
Conventional Method no Textbook Sp. '76, Sec. 1	39	4	35	18.08	19	4,29	10.39
8-Week Instruction Student Teachers with Textbook Fall '75, Sec. 2 & 3	34	8	26	20.36	21	10 16,23	7.03
8-Week Instruction Student Teachers no Textbook Sp. '76, Sec. 2 & 3	37	2	35	17.84	18	20	8.46
Independent Study In-Service Teachers no Textbook Sp. '76, Sec. 4	38	8	30	18.50	17	13,17	8.45

The second and fourth groups listed in the table were handled in a somewhat different manner. For these two groups, a different instructor administered the test and taught the remainder of the course. The

students in these two groups were given the pre-test at the beginning of the first class period, prior to any introduction or outline of the course, and were given twenty to thirty minutes in which to finish the test. This is compared to up to an hour in the other three groups.

The emphasis on not guessing at the answers had a much greater effect on these two groups, subsequently, many questions were left blank which attributed to the lower scores. In some cases only two out of six total pages of the test were completed, which accounted for approximately sixteen out of sixty questions.

The figures in Table II indicate the results of the post-test. The section receiving conventional method of instruction and using the textbook had a maximum high score and the highest low score, which resulted in the shortest range of score distribution. In addition, this group's mean was next to the highest, tied for the highest median and had the lowest standard deviation.

Results of Analysis

This section will deal with answering the research questions stated in Chapter I.

(1) Were the audio-visual instructional modules used an effective means of instruction without the use of a supplemental textbook?

According to the data listed in Table I, the sections which used the textbook had a higher mean average on the post-test, although the student teachers receiving the eight-week instruction and using no textbook had a higher mean than their counterpart. Reason for no-textbook sections being lower was the fact that the independent study group produced a comparative low mean. The results indicate that the textbook

was not needed if the students received formal instruction during a regular class period, therefore indicating that the instructional modules were an effective means of instruction.

(2) Did classroom instruction produce greater mastery of the audio-visual material and techniques than did self-paced instruction?

TABLE II

POST-TEST RESULTS

Teaching Method and Sections	High	Low	Range	Mean	Median	Mode	Standard Deviation
Conventional Method with Textbook Fall, '76, Sec. 1	60	42	18	55.47	58	58	4.61
Conventional Method no Textbook Sp. '76, Sec. 1	60	37	23	54.92	56	59	6.22
8-Week Instruction Student Teachers with Textbook Fall, '75, Sec. 2 & 3	59	30	29	51.85	55	59	7.97
8-Week Instruction Student Teachers no Textbook Sp. '76, Sec. 2 & 3	60	35	25	55.63	58	59	5.42
Independent Study In-Service Teachers no Textbook Sp. '76, Sec. 4	58	27	31	37.42	32.5	27	11.39

As indicated by the results of the post-test as compared to the groups who received some form of formal instruction, the independent

study group was at the bottom. This would indicate that the classroom instruction did in fact, produce a greater mastery of the audio-visual material and techniques than did the self-paced type of instruction.

(3) Which type of instruction provided the student with the most efficient methods of using audio-visual materials?

In answering this question, the independent study group can be readily eliminated if the results indicated in Table II are the only means of measurement used. However, the fact that this group produced results that were noticeably out of proportion to the scores produced by the other groups does not necessarily mean that their range of learning was as low as it may seem. It must be remembered that this section was made up mostly of in-service teachers. The fact that in-service teachers are more experienced in the area of testing and tend to be more mature than the average college level student, it can be assumed they did not "cram" for the post-test as was noted with the undergraduates. This being the case, the in-service teachers may have produced results that indicate a more accurate measure of what was actually learned than did the other groups.

In dealing with the other groups, the decision comes down to comparing the group instructed with the conventional method using a textbook to the eight-week instruction method without a textbook. The data representing these two groups are very close, in relation to their numerical values, the mean being separated by only 0.16 of one point in favor of the eight-week instruction period.

Other determining factors in this evaluation are the low score and the standard deviation of each group. The low score for the conventional method was a 42 as compared to a 35 under the eight-week instruction method. This would indicate that, although the means were nearly equal,

the conventional method with the textbook produced more scores that ranked higher above their mean than did the eight-week method. The standard deviation of the conventional method was lower than that of the eight-week method which indicates the scores were more consistent and closer together in the conventional method group.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

This study was designed to compare a few different methods of instruction to determine which type was best suited for providing students with the knowledge and competencies needed to develop audio-visual material preparation and presentation methods.

The teaching methods studied were: (1) the conventional method, where textbooks were used by full-time students; (2) the conventional method, where textbooks were not used by full-time students; (3) the conventional method, where textbooks were used by students on the eight-week student teaching block; (4) the conventional method, where textbooks were not used by students on the eight-week student teaching block; and (5) the independent study method, with in-service teachers using no textbook.

In each section, the students were provided with a project packet which included an instructional module outlining and explaining each project to be completed. The packet also contained materials to be used in completing most of the projects. The Technical Education Department made available for the student's use audio-visual tape and the audio-visual tape recording equipment.

All of the students were given the opportunity of working on their projects in class and to schedule the use of the lab equipment and facilities outside of class time.

This study attempted to answer these questions:

(1) Were the audio-visual instructional modules used an effective means of instruction without the use of a supplemental textbook?

(2) Did classroom instruction produce greater mastery of the audio-visual material preparation and presentation methods than did self-paced instruction?

(3) Which type of instruction provided the student with the most efficient methods of using audio-visual materials?

The data used in an effort to answer these questions was collected by the use of a pre-test and a post-test. The pre-test was given to all the students prior to receiving any type of audio-visual instruction. The post-test was given to all the students as a final exam.

The scores obtained from these tests were compiled for a two-semester period and used to determine the high and low scores in each group. In addition, the mean, median, mode, range, and standard deviation of each group was determined. These values were then compared to determine which method of instruction provided the best overall scores and results.

Conclusions

The results of the analysis indicated that the textbook was not needed if the students received formal instruction during regular class period, and that the instructional modules were an effective means of instruction if used properly.

Classroom instruction was found to produce a greater mastery of audio-visual material preparation and presentation techniques than did

self-paced instruction.

In addition, the results indicated that the conventional method of instruction with the use of a textbook was the most effective type of instruction studied.

Because there was little difference between the results of the conventional method using a textbook and the eight-week student block using no textbook, the decision of requiring students to purchase a textbook should be thoroughly examined.

If the instruction of the course is designed to master techniques involved in completing the projects, the textbook would probably not be needed. On the other hand, if the instruction is designed to acquaint the student with general knowledge of audio-visual equipment, materials, preparation and presentation methods in addition to the techniques required to complete the projects, the textbook would be needed as a reference and guide.

Recommendations

Prior to any further study on the comparison of teaching methods in audio-visual material preparation and presentation methods the pre-tests and post-tests should be re-constructed to contain questions more directly related to the projects outlined in the modules when no textbook is to be used. This would help to better determine if instructional modules alone were really adequate. It would also tend to make the students get their projects done on time if they knew that the post-test contained questions pertaining to the projects in general.

If the pre-test and post-tests must remain as they are, then the students should be allowed to only see their graded pre-test to check

their performance, and not keep them for study purposes. This would make the students rely more on the knowledge and competencies gained from their projects and force them to use the textbook more, if one is used, for supplemental information. It would also reduce the amount of "cramming" to be done for the post-test, which would result in a more realistic indication of knowledge gained.

If further study is done on comparing different methods of teaching methods of audio-visual methods, it is recommended that an independent study group using the textbook be included as a resource of data.

It is also recommended that either one instructor teach all sections for uniformity of presentation of information or that a different instructor teach each section in order to avoid any possible bias toward one type of teaching method or the other.

In addition, it is recommended that a follow-up study be done, preferably within a couple of years, on the students who have taken this course and have been involved with using audio-visual materials and equipment since graduation. The study should be done to determine which method of instruction was most effective in providing lasting knowledge of audio-visual material preparation and presentation methods. This would give a more realistic indication of the best method of instruction.

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APPENDIX A

LIST OF SYMBOLS AND TERMS

I - Improvement
I_A - Average Improvement
N^A - Number of Characters
P - Post-Test
P^o - Pre-Test
R^R - Range
s - Standard Deviation
Σ - Summation
X - Individual Character
$\overline{X}$ - Mean
X_h - High Score
X_1^h - Low Score

Measures of Central Tendancy

Mean - Average, $\overline{X} = \frac{\Sigma X}{N}$

Median - Midpoint in a set of ranked numbers

Mode - Most often occuring numbers in a set of ranked numbers

Measures of Variability

Range - Difference between the high and low scores of a set of numbers, $R = X_h - X_1$.

Standard Deviation - Average distance of individual numbers from the mean

$$s = \sqrt{\frac{\Sigma (X-\overline{X})^2}{N}}$$

APPENDIX B

THE INSTRUMENT: PRE-TEST

1. Which of the following is a good reason for developing a visual aid:

   a. when something is needed to do a <u>better</u> job of teaching
   b. when no teaching materials exist
   c. neither a nor b above
   d. either a or b above

2. One of the first things you should do in planning a visual aid is:

   a. write out specific objectives
   b. try to use color and action
   c. choose the media to be used
   d. prepare the materials

3. Which of the following skills are needed in planning and producing a visual aid:

   a. subject matter skills
   b. communications skills
   c. production skills
   d. all three of the above skills

4. In planning a visual aid a content outline will help in:

   a. organizing the material to satisfy the objectives
   b. choosing the scenes to be photographed
   c. reaching the audience
   d. none of the above

5. A content outline for a planned visual aid will help you decide if:

   a. color is important
   b. sound is important
   c. motion is important
   d. all of the above

6. The size of the standard slide is:

   a. 2¼ x 2¼ inches
   b. 126 size
   c. 35mm x 35mm
   d. 2 x 2 inches

7. An advantage of a film strip is:

   a. ease of handling
   b. low duplication cost
   c. the sequence doesn't change
   d. all of the above

8. Transparency overlays are used mainly to:

   a. show motion
   b. develop progressive sequences
   c. add color to a presentation
   d. none of the above

9. Multimedia presentations always:

   a. involve two or more different media
   b. stimulate all five senses
   c. stimulate two or more senses
   d. employ visual aids

10. An advantage of photographic slides is:

   a. they stay in sequence
   b. they require no special skill to produce
   c. they can be produced without special equipment
   d. they are easily adapted to group or individual use

11. A disadvantage of film strips is that they:

   a. get out of sequence easily
   b. are projected with very complicated equipment
   c. are difficult to produce locally
   d. are expensive to reproduce in quantity

12. Which one of the following is least adaptable to individual study:

   a. 35mm slides
   b. overhead transparencies
   c. 8mm movies
   d. audio tapes

13. A visual outline of a planned visual aid series is most likely to be called:

   a. the content outline
   b. the editing directions
   c. the shooting script
   d. the storyboard

14. A storyboard may include:

   a. photographs
   b. sketches
   c. clippings (photo from magazines, etc.)
   d. any of the above

15. In photographing pictures for a slide series you should:

    a. always take the pictures in the same sequence that will be used in the finished product
    b. always use a 35mm camera
    c. never deviate from the storyboard
    d. always keep an accurate record of what pictures were taken

16. Which of the following is not a step in planning a visual aids presentation:

    a. develop the objectives
    b. write the instruction guide
    c. make a storyboard
    d. schedule the photography

17. Parallax is quite likely to become a problem when photographing:

    a. all of the below
    b. titles
    c. small objects
    d. close-ups

18. Parallax is not likely to become a problem when photographing:

    a. an insect
    b. a page in a book
    c. a landscape
    d. all of the above

19. Daylight color film (the kind most used for everyday photographs) can be used best indoors with:

    a. an electronic flash attachment
    b. fluorescent lights
    c. incandescent lights
    d. any of the above

20. Probably the most common error made in producing overhead transparencies is:

    a. trying to include too much information
    b. using too much color
    c. having the room too dark
    d. using letters that are too large

21. The maximum number of words that should normally be used in a transparency is about:

    a. 35-40
    b. 25-30
    c. 15-20
    d. 5-10

22. Color can be added to an overhead transparency using:

    a. spray can paints
    b. colored pencils
    c. felt tip pens
    d. any of the above

23. Color can be added to an overhead transparency using:

    a. any of the below
    b. colored plastic sheets
    c. special color processes
    d. chalk

24. Two by two slides are usually made with:

    a. a 35mm camera
    b. a 126 camera
    c. a 127 camera
    d. any of the above

25. A 2 x 2 slide with a 2:3 aspect ratio can be made with:

    a. a 127 camera
    b. a 126 camera
    c. a 35mm camera
    d. any of the three

26. In making a film strip from 35mm slides, the original slides must be photographed holding the camera:

    a. at waist level
    b. on its edge
    c. either a or b
    d. normally

27. Film strips can be produced directly using:

    a. a 126 camera
    b. a double frame 35mm camera
    c. a single frame 35mm camera
    d. any of the three

28. The view area inside an overhead transparency frame is:

    a. 8½" x 11"
    b. 10" x 10"
    c. 8" x 10"
    d. 7½" x 9½"

29. Lettering directly onto an overhead transparency can be done with:

a. dry transfers
b. ball point pen
c. ordinary pencil
d. any of the three

30. A popular type of copier found in schools is likely to be:

a. a dry copier
b. a wet copier
c. a Thermo copier
d. any of the three

31. Video tape records information in the form of:

a. written material
b. audio
c. video
d. both b and c

32. The least depth of field will be obtained when the lens diaphragm is set at:

a. 1/125
b. 1/250
c. f/5.6
d. f/4

33. 126 film and camera will bring about a:

a. semi-square picture
b. semi-rectangular picture
c. rectangular picture
d. square picture

34. An ASA 64 film requires less light than a:

a. 125 film
b. 100 film
c. 80 film
d. 25 film

35. The depth of field will be greatest when the f/stop of a camera is set at:

a. 8
b. 16
c. 22
d. 5.6

36. What is the proportion ratio for a standard slide (35mm)

a. 4:5
b. 3:4
c. 2:3
d. 1:1

37. For nonprojected materials the minimum letter height for a maximum viewing distance of 32 feet is:

a. 2 inch
b. 1½ inch
c. 1 inch
d. ½ inch

38. The recommended shutter speed for people and animals walking towards or away from the camera is:

a. 1/250 - 1/300 second
b. 1/100 - 1/125 second
c. 1/50 - 1/60 second
d. none of the above

39. The part of a camera that is somewhat like the eyelids of the human eye is called:

a. viewfinder
b. lens
c. lens diaphragm
d. shutter

40. Which of the following <u>are</u> normally developed into slide pictures:

a. ektachrome
b. tri-x
c. kodacolor
d. ektacolor

41. What should be the minimum letter size on transparencies:

a. 1" to 1/2 "
b. 3/4" to 1 "
c. 1/8" to 1/4 "
d. 1/4" to 3/8 "

42. Video tape has:

a. a magnetic video and magnetic audio track
b. an optical video and an optical audio track
c. both of the above
d. none of the above

43. What are the dimensions of the lighted surface of an overhead projector:

a. 7½" x 9½"
b. 8½" x 11"
c. 9" x 8"
d. 10" x 10"

44. To correct an overexposed transparency you must:

a. increase development time
b. increase exposure time
c. decrease exposure time
d. none of the above

45. What determines the printed color on the spirit master:

a. carbon
b. fluid
c. paper
d. color of lead pencil or type ribbon

46. With sound reproduction from a movie projector, the film is projected at a rate of:

a. 24 frames per second
b. 20 frames per second
c. 18 frames per second
d. 16 frames per second

47. The sound which belongs to any specific picture is located how many frames from the picture:

a. 28
b. 26
c. 24
d. 20

48. Slides most commonly used in the classroom are:

a. 2 3/4 x 3 inches
b. 2 3/4 x 2 3/4 inches
c. 2 1/4 x 2 1/4 inches
d. 2 x 2 inches

49. It is possible to reproduce two or more colors on one spirit master. The color or colors reproduced are determined by:

a. color of paper used for reproducing
b. color of the reproducing fluid
c. color of the master
d. color of the carbon

50. A 35mm camera will take pictures for slides. The shape of the picture on this slide will be:

a. square
b. rectangular
c. neither a nor b is correct
d. both a and b are correct

51. Models may be:

a. reduced size
b. enlargements
c. actual size
d. all of the above

52. Video taping uses all of these devices except:

a. monitor
b. projector
c. TV camera
d. reel of tape

53. A thermofax machine may be used in making (a) or (an):

a. overlay
b. transparency
c. neither a nor b are correct
d. both a and b are correct

54. Overhead transparencies can be:

a. made by hand
b. made on most copying machines
c. made on a spirit duplicator
d. all of the above

55. In planning a slide series which of the following should be done first:

a. identify the audience
b. make a storyboard
c. select the strategy
d. specify the objective

56. In planning a presentation which of the following should be done last:

a. identify the criteria
b. select the media
c. make an outline
d. specify the objectives

57. A storyboard is:

a. useful in planning slides only
b. useful in planning most visual presentations
c. useful in planning movies only
d. useful in planning filmstrips only

58. Daylight film can be used without a filter with:

a. 3200 k lamps
b. photo flood lamps
c. blue flash bulbs
d. clear flash bulbs

59. A photographic scene can be viewed without parallax with:

a. a reflex viewer camera
b. a parallel window viewer camera
c. either a or b
d. neither a nor b

60. 3200 k lamps can be used without filters with:

a. type B film
b. type A film
c. daylight film
d. any of the above

APPENDIX C

THE INSTRUMENT: POST-TEST

1. Which of the following is a good reason for developing a visual aid:

   a. when something is needed to do a better job of teaching
   b. when no teaching materials exist
   c. to replace the text material
   d. either a or b above

2. One of the first things you should do in planning a visual aid is:

   a. write out specific objectives
   b. try to use color and action
   c. choose the media to be used
   d. prepare the materials

3. Which of the following skills are needed in planning and producing visual aids:

   a. subject matter skills
   b. communications skills
   c. production skills
   d. all three of the above skills

4. In planning a visual aid a content outline will help in:

   a. organizing the materials to satisfy the objectives
   b. choosing the scenes to be photographed
   c. reaching the audience
   d. identifying specific objectives

5. A content outline for a planned visual aid will help you decide if:

   a. color is important
   b. sound is important
   c. motion is important
   d. all of the above

6. Multimedia presentations always:

   a. involve two or more different medias
   b. stimulate all five senses
   c. stimulate two or more senses
   d. employ visual aids

7. Which of the following is not a step in planning a visual aids presentation:

   a. develop the objectives
   b. write the instruction guide
   c. make a storyboard
   d. schedule the photography

8. In planning a presentation which of the following should be done last:

   a. identify the criteria
   b. select the media
   c. make an outline
   d. specify the objectives

9. A storyboard is:

   a. useful in planning slides only
   b. useful in planning most visual presentations
   c. useful in planning movies only
   d. useful in planning filmstrips only

10. The size of the standard slide is:

   a. 2¼ x 2¼ inches
   b. 126 size
   c. 35mm x 35mm
   d. 2 x 2 inches

11. The maximum viewing distance for projected material to be viewed at can be denoted as:

   a. 6w
   b. 8w
   c. 10w
   d. 12w

12. An advantage of photographic slides is:

   a. they stay in sequence
   b. they require no special skill to produce
   c. they can be produced without special equipment
   d. they are easily adapted to group or individual use

13. Which one of the following is least adaptable to individual study:

   a. 35mm slides
   b. overhead transparencies
   c. 8mm movies
   d. audio tapes

14. In photographing pictures for a slide series you should:

   a. always take the picture in the same sequence that will be used in the finished product
   b. always use a 35mm camera
   c. never deviate from the storyboard
   d. always keep an accurate record of what pictures were taken

15. Two by two slides are usually made with:

a. a 35mm camera
b. a 126 camera
c. a 127 camera
d. any of the above

16. An advantage of a film strip is:

a. ease of handling
b. low duplication costs
c. the sequence doesn't change
d. all of the above

17. A disadvantage of filmstrips is that they:

a. get out of sequence easily
b. are projected with very complicated equipment
c. are difficult to produce locally
d. are expensive to reproduce in quantity

18. A 2 x 2 slide with a 2:3 aspect ratio can be made with:

a. a 127 camera
b. a 126 camera
c. a 35mm camera
d. 620 SLR camera

19. In making a film strip from 35mm slides, the original slides must be photographed holding the camera:

a. at waist level
b. on its edge
c. either a or b
d. normally

20. Film strips can be produced directly using:

a. a 126 camera
b. a double frame 35mm camera
c. a single frame 35mm camera
d. a 127 camera

21. What is the proportion ratio for a standard slide (35mm)

a. 4:5
b. 3:4
c. 2:3
d. 1:1

22. Which of the following are normally developed into slide pictures:

a. ektachrome
b. tri-x
c. kodacolor
d. ektacolor

23. Slides most commonly used in the classroom are:

a. 2 3/4 x 3 inches
b. 2 3/4 x 2 3/4 inches
c. 2 1/4 x 2 1/4 inches
d. 2 x 2 inches

24. A 35mm camera will take pictures for slides. The shape of the picture on this slide will be:

a. square
b. rectangular
c. neither a nor b is correct
d. both a and b are correct

25. Models may be:

a. reduced size
b. enlargements
c. actual size
d. any of the above

26. In planning a slide series which of the following should be done first:

a. identify the audience
b. make a storyboard
c. select the strategy
d. specify the objective

27. Daylight film can be used without a filter with:

a. 3200 K lamps
b. photo flood lamps
c. blue flash bulbs
d. clear flash bulbs.

28. A photographic scene can be viewed without parallax with:

a. a reflex viewer camera
b. a parallel window viewer camera
c. a 126 camera
d. a 110 camera

29. 3200 K lamps can be used without filters with:

a. type B film
b. type A film
c. daylight film
d. any of the above

30. Transparency overlays are used mainly to:

a. show motion
b. develop progressive sequences
c. add color to a presentation
d. save time

31. A visual outline of a planned visual aid series is most likely to be called:

a. the content outline
b. the editing directions
c. the shooting script
d. the storyboard

32. A storyboard may include:

a. photographs
b. sketches
c. clippings (photo from magazine, etc.)
d. any of the above

33. Parallax is most likely to become a problem when photographing:

a. landscapes
b. small objects
c. buildings
d. people

34. Parallax is <u>not</u> likely to become a problem when photographing:

a. an insect
b. a page in a book
c. a landscape
d. small objects

35. Probably the most common error made in producing overhead transparencies is:

a. trying to include too much information
b. using too much color
c. having the room too dark
d. using letters that are too large

36. The maximum number of words that should normally be used in a transparency is:

a. 35-40
b. 25-30
c. 15-20
d. 5-10

37. Color can be added to an overhead transparency using:

a. spray can paints
b. colored pencils
c. felt tip pens
d. any of the above

38. Color can be added to an overhead transparency using:

a. any of the below
b. colored plastic sheets
c. special color processes
d. chalk

39. The view area inside an overhead transparency frame is:

a. 8½" x 11"
b. 10" x 10"
c. 8" x 10"
d. 7½" x 9½"

40. Lettering directly onto an overhead transparency can be done with:

a. dry transfers
b. ball point pen
c. ordinary pencil
d. any of the three

41. Daylight color film (the kind most used for everyday photographs) can be used best indoors with:

a. an electronic flash attachment
b. fluorescent lights
c. incandescent lights
d. any of the above

42. A popular type of copier found in schools is likely to be:

a. a dry copier
b. a wet copier
c. a thermo copier
d. any of the three

43. It is possible to reproduce two or more colors on one spirit master. The color or colors reproduced are determined by:

    a. color of paper used for reproducing
    b. color of the reproducing fluid
    c. color of the master
    d. color of the carbon

44. A thermofax machine may be used in making:

    a. an overlay
    b. a transparency
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    b. made on most copying machines
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46. Video taping uses all of these devices except:

    a. monitor
    b. projector
    c. TV camera
    d. reel of tape

47. Video tape has:

    a. a magnetic video and magnetic audio track
    b. an optical video and an optical audio track
    c. an optical video and magnetic audio track
    d. none of the above

48. Video tape records information in the form of:

    a. written material
    b. audio
    c. video
    d. both b and c

49. The least depth of field will be obtained with the lens diaphragm set at:

    a. 1/125
    b. 1/250
    c. f/5.6
    d. f/4

50. 126 film and camera will bring about a:

a. semi-square picture
b. semi-rectangular picture
c. rectangular picture
d. square picture

51. An ASA 64 film requires less light than a:

a. 125 film
b. 100 film
c. 80 film
d. 25 film

52. The depth of field will be greatest when the f/stop of a camera is set at:

a. 8
b. 16
c. 22
d. 5.6

53. For nonprojected materials the minimum letter height for a maximum viewing distance of 32 feet is:

a. 2 inches
b. 1½ inches
c. 1 inch
d. ½ inch

54. The recommended shutter speed for people and animals walking towards or away from the camera is:

a. 1/250 - 1/300 second
b. 1/100 - 1/125 second
c. 1/50 - 1/60 second
d. 1/500 - 1/600 second

55. The part of a camera that is somewhat like the eyelids of the human eye is called:

a. viewfinder
b. lens
c. lens diaphragm
d. shutter

56. What should be the minimum letter size on transparencies:

a. 1" to 1/2"
b. 3/4" to 1"
c. 1/8" to 1/4"
d. 1/4" to 3/8"

57. What are the dimensions of the lighted surface of an overhead projector:

a. 7½" x 9½"
b. 8½" x 11"
c. 9" x 8"
d. 10" x 10"

58. To correct an overexposed transparency you must:

a. increase development time
b. increase exposure time
c. decrease exposure time
d. none of the above

59. With sound reproduction from a movie projector, the film is projected at a rate of:

a. 24 frames per second
b. 20 frames per second
c. 18 frames per second
d. 16 frames per second

60. The sound which belongs to any specific picture is located how many frames from the picture:

a. 28
b. 26
c. 24
d. 20

APPENDIX D

RAW DATA - TEST SCORES

FALL 1975

SECTION 1

Pre-Test*	Post-Test*
9	42
11	48
15	52
16	53
17	54
17	55
20	57
24	57
27	58
28	58
28	58
29	58
29	58
31	58
37	58
39	59
41	60

*Scores based on a maximum possible of 60.

FALL 1975

SECTION 2

Pre-Test*	Post-Test*
8	30
9	37
10	38
10	41
10	44
11	45
11	47
12	50
13	52
16	52
17	54
18	55
19	56
19	56
21	56
23	57
24	57
24	57
25	57
26	58
27	58
27	58
28	58
29	59
34	59

*Scores based on a possible maximum of 60.

FALL 1975

SECTION 3

Pre-Test*	Post-Test*
9	33
13	36
16	43
16	48
17	51
18	52
21	53
22	54
23	55
23	55
25	58
26	59
29	59
30	59
31	59
31	59

* Scores based on a possible maximum of 60.

SPRING 1976

SECTION 1

Pre-Test*	Post-Test*
4	37
4	49
7	54
11	54
14	55
16	55
19	56
20	57
21	59
22	59
29	59
29	60
39	60

*Scores based on a maximum possible of 60.

SPRING 1976

SECTION 2

Pre-Test*	Post-Test*
2	35
3	42
4	46
4	48
4	50
5	51
7	51
7	56
11	56
13	56
13	57
14	57
17	58
18	58
19	58
20	59
20	59
21	59
21	59
27	59
27	59
28	60
29	60

* Scores based on a possible maximum of 60.

SPRING 1976

SECTION 3

Pre-Test*	Post-Test*
7	50
13	51
16	55
18	55
18	57
19	57
19	58
20	58
20	59
23	59
30	59
35	60
37	60

* Scores based on a possible maximum of 60.

SPRING 1976

SECTION 4

Pre-Test*	Post-Test*
8	27
9	27
13	28
13	29
14	31
17	32
17	33
19	36
23	41
25	52
26	55
38	58

* Scores based on a possible maximum of 60.

APPENDIX E

AVERAGE STUDENT IMPROVEMENT

AVERAGE STUDENT IMPROVEMENT, I_A

CONVENTIONAL STYLE, WITH TEXTBOOK

P_R	P_o	I
11	57	46
9	54	45
41	58	17
39	53	14
16	48	32
29	60	31
17	58	41
15	55	40
27	58	31
20	58	38
31	42	11
39	58	29
28	58	30
17	59	42
37	57	20
28	58	30
		497

N = 16

$$I_A = \frac{497}{16} = 31.06$$

AVERAGE STUDENT IMPROVEMENT, I_A

CONVENTIONAL STYLE, NO TEXTBOOK

P_R	P_o	I
16	59	43
19	54	35
20	56	36
4	55	51
22	37	15
7	60	53
4	54	50
29	59	30
29	60	31
14	59	45
11	55	44
21	57	36
39	49	10
		479

$N = 13$

$$I_A = \frac{\Sigma \text{ (Post-Pre)}}{N}$$

$$I_A = \frac{479}{13} = 36.85$$

AVERAGE STUDENT IMPROVEMENT, I_A

8-WEEK INSTRUCTION, STUDENT TEACHERS, WITH TEXTBOOK

P_R	P_o	I
10	57	47
18	58	40
13	57	44
19	54	35
16	56	40
8	58	50
9	57	48
11	47	36
19	59	40
24	52	28
11	50	39
27	30	3
23	52	29
27	38	11
12	45	33
29	44	15
25	57	32
24	41	17
34	56	22
17	56	39
10	59	49
28	55	23
26	58	32
10	58	48
21	37	16
29	55	26
30	59	29
25	59	34
23	54	31
26	51	25
16	36	20
21	53	32
31	48	17
17	59	42
16	33	17
31	59	28
13	55	42
22	52	30
18	43	25
9	59	50
23	58	35
24	52	28
		1327

$N = 42$

$$I_A = \frac{1327}{42} = 31.60$$

AVERAGE STUDENT IMPROVEMENT, I_A

8-WEEK INSTRUCTION, STUDENT TEACHERS NO TEXTBOOK

P_R	P_o	I
5	59	54
4	60	56
2	59	57
21	60	39
23	51	28
27	58	31
18	57	39
11	56	45
7	50	43
4	59	55
19	56	37
28	51	23
27	59	32
20	35	15
13	58	45
29	48	19
4	57	53
17	42	25
7	59	52
14	56	42
20	59	39
21	46	25
13	58	45
35	51	16
20	59	39
18	59	41
19	58	39
20	60	40
30	59	29
18	57	39
37	55	18
19	60	41
13	58	45
7	55	48
16	57	51
23	50	27
		1362

$N = 36$

$$I_A = \frac{1362}{36} = 37.83$$

VITA

Walter Eherhart Lentz

Candidate for the Degree of

Master of Science

Thesis: A COMPARISON OF VARIOUS METHODS OF AUDIO-VISUAL INSTRUCTION

Major Field: Technical Education

Biographical:

Personal Data: Born in Anchorage, Alaska, March 30, 1952, the son of Mr. and Mrs. Marvin Gail Lentz.

Education: Graduated from Collinsville High School, Collinsville, Oklahoma, in May, 1970; received Bachelor of Science degree in Engineering Technology from Oklahoma State University in December, 1974; enrolled in masters program at Oklahoma State University, 1975-76; completed requirements for the Master of Science degree at Oklahoma State University in July, 1976.

Professional Experience: Draftsman and Illustrator, Electronics Systems Engineering Company, Cushing, Oklahoma, 1974. Mechanical Drawing Lab Instructor, School of Technology, Oklahoma State University, 1975; Electrician, School of Technology, Oklahoma State University, 1975; Graduate Assistant, School of Occupational and Adult Education, Oklahoma State University, 1975-76; Electrician, School of Mechanical Engineering, Oklahoma State University, 1976.

Professional Organizations: Member Phi Delta Kappa, Oklahoma State University, 1976; Member, Red Red Rose, Stillwater, Oklahoma Chapter, 1975; Certified Engineering Technician, #050875, 1975; Who's Who Among Students in American Universities and Colleges, 1974-75.